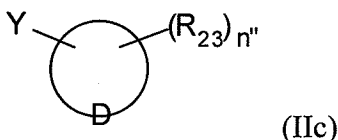


### Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-46. (Canceled).

47. (Currently Amended) A method of creating a carbon-heteroatom bond by reacting a leaving group-bearing unsaturated compound and a nucleophilic compound introducing a heteroatom which can substitute for the leaving group, thereby creating a carbon-heteroatom bond, in the presence of a palladium-based catalyst, ~~optionally a ligand,~~ said reaction taking place in the presence of an effective amount of a metal hydroxide or ammonium hydroxide, with an alcohol solvent, wherein said leaving group-bearing unsaturated compound is an aromatic compound subsequently referred to as "haloaromatic compound" and that can be represented by formula (IIc):



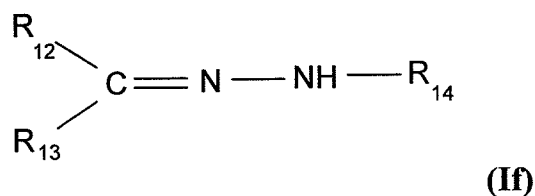
wherein:

- D is a benzene ring,
  - R<sub>23</sub>, which is identical or different, represent substituents on the ring,
  - Y represents a leaving group, ~~optionally a halogen atom or a sulfonic ester group of formula -OSO<sub>2</sub>-R<sub>e</sub>, in which R<sub>e</sub> is a hydrocarbon group,~~
  - n'' represents the number of substituents on the ring,
- and wherein said nucleophilic compound is a hydrazone.

48-55. (Canceled).

56. (Currently Amended) The method as claimed in claim 47, wherein the

nucleophilic compound corresponds to the formula below:



wherein:

- $\text{R}_{12}$ ,  $\text{R}_{13}$  and  $\text{R}_{14}$ , which are identical or different, represent, independently of one another, a hydrogen atom or a hydrocarbon group having from 1 to 20 carbon atoms, ~~optionally a linear or branched, saturated or unsaturated, acyclic aliphatic group; a monocyclic or polycyclic, saturated, unsaturated or aromatic carbocyclic or heterocyclic group; a chain of the abovementioned groups,~~
- at most one of the groups  $\text{R}_{12}$  and  $\text{R}_{13}$  represents a hydrogen atom, or
- else  $\text{R}_{12}$  and  $\text{R}_{13}$  are linked so as to constitute, with the carbon atoms that bear them, a monocyclic or polycyclic, saturated, unsaturated or aromatic, carbocyclic or heterocyclic group having from 3 to 20 atoms.

57-58. (Canceled).

59. (Previously Presented) The method as claimed in claim 47, wherein the nucleophilic compound is benzophenone hydrazone.

60-63. (Canceled).

64. (Previously Presented) The method as claimed in claim 47, wherein the leaving group-bearing compound is p-chlorotoluene, p-bromoanisole or p-bromotrifluorobenzene.

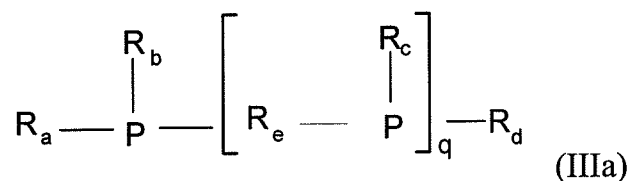
65. (Currently amended) The method as claimed in claim 47, wherein the catalyst comprises the metal element Pd introduced in the form of a finely divided metal, in the

form of an inorganic derivative; in the form of a mineral salt, ~~optionally nitrate, sulfate, oxysulfate, halide, oxyhalide or carbonate;~~ in the form of an organic derivative, ~~optionally cyanide, oxalate, acetylacetonate; alkoxide, methoxide, or ethoxide; carboxylate, acetate,~~ or in the form of a complex, ~~optionally a chlorinated or cyanated complex of Pd metals and/or of alkali metals, optionally sodium or potassium, or of ammonium.~~

66. (Previously presented) The method as claimed in claim 65, wherein the Pd element is introduced through palladium chloride, palladium acetate or palladium-on-charcoal.

67. (Previously presented) The method as claimed in claim 47, wherein the ligand is a phosphine, a phosphite or a phosphonite.

68. (Previously presented) The method as claimed in claim 67, wherein the phosphine corresponds to the formula below:



in said formula:

- q is equal to 0 or 1,
- the groups  $R_a$ ,  $R_b$ ,  $R_c$  and  $R_d$ , which are identical or different, represent:
  - . an alkyl group having from 1 to 12 carbon atoms,
  - . a cycloalkyl group having 5 or 6 carbon atoms,
  - . a cycloalkyl group having 5 or 6 carbon atoms, which is substituted with one or more alkyl groups having 1 to 4 carbon atoms, or alkoxy groups having 1 or 4 carbon atoms,
  - . a phenylalkyl group in which the aliphatic portion contains from 1 to 6 carbon

atoms,

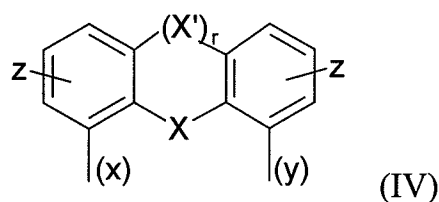
. a phenyl or biphenyl group,

. a phenyl or biphenyl group substituted with one or more alkyl groups having from 1 to 4 carbon atoms or alkoxy groups having from 1 to 4 carbon atoms, one or more halogen atoms, or a trifluoromethyl group,

- the group  $R_e$  represents:

. a valency bond or a saturated or unsaturated, linear or branched divalent hydrocarbon group having from 1 to 6 carbon atoms,

. an aromatic group of formula:



in which:

✧ Z represents a hydrogen atom, an alkyl group having from 1 to 10 carbon atoms, a halogen atom or a trifluoromethyl group,

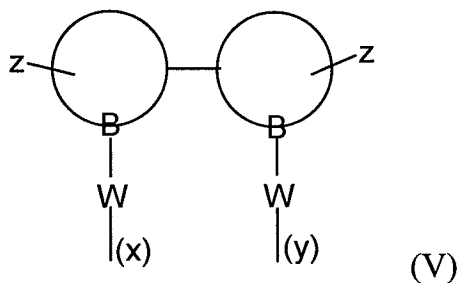
✧ X is an oxygen or sulfur atom or a linear or branched alkylene group having from 1 to 3 carbon atoms,

✧ if r is equal to 1, X' represents a valency bond, an oxygen, sulfur or silicon atom or a linear or branched alkylene group having from 1 to 3 carbon atoms,

✧ if r is equal to 0, the two rings are not linked,

✧ (x) and (y) pinpoint respectively the two bonds established between the group  $R_e$  symbolized by formula (IV) and the phosphorus atoms,

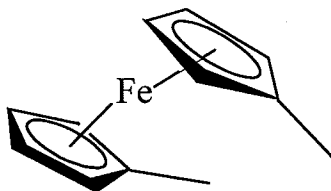
. an aromatic group of formula:



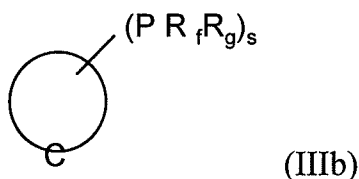
in which:

- ✧ Z has the meaning given above,
- ✧ B represents the residue of a benzene or naphthalene ring,
- ✧ W represents a valency bond or a linear or branched alkylene group having from 1 to 3 carbon atoms,
- ✧ (x) and (y) pinpoint respectively the two bonds established between the group  $R_e$  symbolized by formula (V) and the phosphorus atoms,

. a ferrocene group of formula:



69. (Currently Amended) A method as claimed in claim 67, wherein the phosphine corresponds to the formula below:

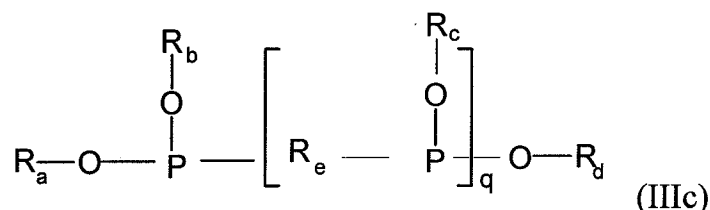


in which:

- ✧ C represents the residue of a pentane or cyclohexane ring,
- ✧  $R_f$  and  $R_g$ , which may be identical or different, have the meaning given for  $R_a$  or  $R_b$  in formula (IIIa) in claim 68 represent:
  - . an alkyl group having from 1 to 12 carbon atoms,
  - . a cycloalkyl group having 5 or 6 carbon atoms,
  - . a cycloalkyl group having 5 or 6 carbon atoms, which is substituted with one or more alkyl groups having 1 to 4 carbon atoms, or alkoxy groups having 1 or 4 carbon atoms,
  - . a phenylalkyl group in which the aliphatic portion contains from 1 to 6 carbon atoms,

- . a phenyl or biphenyl group,
- . a phenyl or biphenyl group substituted with one or more alkyl groups having from 1 to 4 carbon atoms or alkoxy groups having from 1 to 4 carbon atoms, one or more halogen atoms, or a trifluoromethyl group, and
- ✧ s is a number equal to 1 to 6.

70. (Currently Amended) The method as claimed in claim 67, wherein the phosphonite corresponds to the formula below:

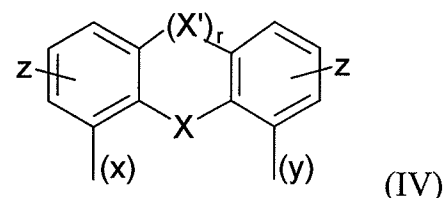


in said formula; ~~the groups  $R_a$ ,  $R_b$ ,  $R_c$ ,  $R_d$  and  $R_e$ , and the symbol  $q$  have the meaning given in formula (IIIa) in claim 68.~~

- $q$  is equal to 0 or 1,
- the groups  $R_a$ ,  $R_b$ ,  $R_c$  and  $R_d$ , which are identical or different, represent:
  - . an alkyl group having from 1 to 12 carbon atoms,
  - . a cycloalkyl group having 5 or 6 carbon atoms,
  - . a cycloalkyl group having 5 or 6 carbon atoms, which is substituted with one or more alkyl groups having 1 to 4 carbon atoms, or alkoxy groups having 1 or 4 carbon atoms,
  - . a phenylalkyl group in which the aliphatic portion contains from 1 to 6 carbon atoms,
  - . a phenyl or biphenyl group,
  - . a phenyl or biphenyl group substituted with one or more alkyl groups having from 1 to 4 carbon atoms or alkoxy groups having from 1 to 4 carbon atoms, one or more halogen atoms, or a trifluoromethyl group,
- the group  $R_e$  represents:
  - . a valency bond or a saturated or unsaturated, linear or branched divalent

hydrocarbon group having from 1 to 6 carbon atoms,

. an aromatic group of formula:



in which:

✧ Z represents a hydrogen atom, an alkyl group having from 1 to 10 carbon atoms, a halogen atom or a trifluoromethyl group,

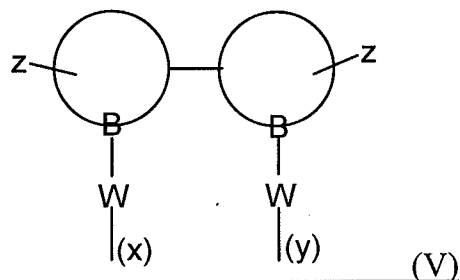
✧ X is an oxygen or sulfur atom or a linear or branched alkylene group having from 1 to 3 carbon atoms,

✧ if r is equal to 1, X' represents a valency bond, an oxygen, sulfur or silicon atom or a linear or branched alkylene group having from 1 to 3 carbon atoms,

✧ if r is equal to 0, the two rings are not linked,

✧ (x) and (y) pinpoint respectively the two bonds established between the group  $R_e$  symbolized by formula (IV) and the phosphorus atoms,

. an aromatic group of formula:



in which:

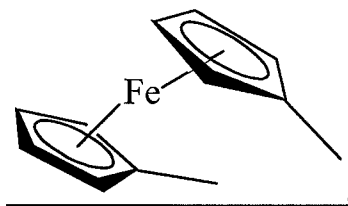
✧ Z has the meaning given above,

✧ B represents the residue of a benzene or naphthalene ring,

✧ W represents a valency bond or a linear or branched alkylene group having from 1 to 3 carbon atoms,

✧ (x) and (y) pinpoint respectively the two bonds established between the group  $R_e$  symbolized by formula (V) and the phosphorus atoms,

. a ferrocene group of formula:



71. (Previously presented) The method as claimed in claim 67, wherein the ligand is: tricyclohexylphosphine, trimethylphosphine, triethylphosphine, tri-*n*-butylphosphine, triisobutylphosphine, tri-*tert*-butylphosphine, tribenzylphosphine, dicyclohexylphenylphosphine, 2-dicyclohexylphosphino-2-methylbiphenyl, triphenylphosphine, dimethylphenylphosphine, diethylphenylphosphine, di-*tert*-butylphenylphosphine, tri(*p*-tolyl)phosphine, isopropylidiphenylphosphine, tris(pentafluorophenyl)phosphine, tri(*o*-tolyl)phosphine, bisdiphenylphosphinomethane, bisdiphenylphosphinoethane, bisdiphenylphosphinopropane, bisdiphenylphosphinobutane, bisdiphenylphosphinopentane, bisdiphenylphosphinoferrocene, 2,2'-bis(diphenylphosphino)-1,1'-binaphthyl (BINAP), bis-[(2-diphenylphosphino)phenyl] ether (DPEPHOS), 4,5-bis(diphenylphosphino)-9,9-dimethylxanthene (XANTPHOS), or tetrakis-(2,4-di-*tert*-butylphenyl)-4,4'-diphenylenebisphosphonite.

72. (Currently Amended) The method as claimed in claim 47, wherein the base is an ammonium hydroxide or a hydroxide of a monovalent metal and/or of a bivalent metal, ~~optionally an alkali and/or alkaline earth metal~~, introduced in a solid form or in a solution.

73. (Previously presented) The method as claimed in claim 47, wherein the solvent is a monoalcohol, a polyalcohol, an ether alcohol or an amino alcohol.

74. (Previously presented) The method as claimed in claim 73, wherein the



alcohol is a primary alcohol or secondary alcohol that is hindered or a tertiary alcohol, said alcohol corresponds to the formula below:



in said formula (VI):

-  $R_h$  represents an optionally substituted hydrocarbon group having from 1 to 24 carbon atoms, which is a linear or branched, saturated or unsaturated acyclic aliphatic group; a monocyclic or polycyclic, saturated or unsaturated cycloaliphatic group; or a linear or branched, saturated or unsaturated aliphatic group bearing a cyclic substituent.

75. (Previously presented) The method as claimed in claim 74, wherein the solvent is n-butanol, tert-butanol, ethylene glycol, N,N-dimethylethanolamine; methoxyethanol, 1-methoxypropan-2-ol, or tert-amyl alcohol.

76. (Previously presented) The method as claimed in claim 72, wherein a reactive milling of the metal hydroxide or ammonium hydroxide and of the alcohol is carried out.

77. (Previously presented) The method as claimed in claim 72, wherein a reactive milling of sodium hydroxide (already milled or in the form of pellets) and of tert-amyl alcohol or tert-butanol is carried out.

78. (Currently Amended) The method as claimed in claim 47, wherein the compound introducing the Pd element, is used in an amount, expressed by the molar ratio of the number of moles of said Pd compound to the number of moles of compound of formula (IIc), ranges between 0.005 and 1, ~~optionally between 0.01 and 0.1.~~

79. (Previously Presented) The method as claimed in claim 47, wherein the alcohol-type solvent is further combined with a co-solvent which is an apolar aprotic solvent.

80. (Currently Amended) The method as claimed in claim 79, wherein the apolar aprotic solvent is an aliphatic, cycloaliphatic or aromatic hydrocarbon, ~~optionally hexane, cyclohexane, methylcyclohexane, or petroleum ether cuts; an aromatic hydrocarbon, optionally benzene, toluene, xylenes, cumene, mesitylene, or petroleum cuts consisting of a mixture of alkylbenzenes.~~

81. (Currently Amended) The method as claimed in 79, wherein the co-solvent is used in an amount representing from 1 to 50% of the volume of the alcohol solvent, ~~optionally from 10 to 20%.~~

82. (Previously Presented) The method as claimed in claim 47, wherein the coupling reaction between the nucleophilic compound and the leaving group-bearing unsaturated compound takes place at a temperature which is chosen such that the reactants are maintained in the liquid state.

83. (Currently Amended) The method as claimed in claim 82, wherein the temperature is situated between 50°C and 200°C, ~~optionally between 90°C and 110°C.~~

84. (Previously Presented) The method as claimed in claim 47, wherein the leaving group-bearing unsaturated compound, the base, the alcohol solvent are loaded; the compound introducing the Pd metal element and the ligand or else the preformed metal complex are added separately to the medium; the reaction medium is brought to the selected reaction temperature; the nucleophilic compound, is subsequently added and the coupling product obtained is then recovered.

85. (Previously Presented) The method as claimed in claim 47, wherein the coupling product obtained is benzophenone N-p-tolylhydrazone, benzophenone N-phenylhydrazone, benzophenone N-p-methoxyphenylhydrazone, benzophenone

N-o-tolylhydrazone, benzophenone N-p-fluorophenylhydrazone, benzophenone N-4-fluoro-3-chlorophenylhydrazone, benzophenone N-2-fluoro-5-chlorophenylhydrazone, or benzophenone N-4-fluoro-3-cyanophenylhydrazone.

86. (New) The method of claim 47, wherein the palladium-based catalyst is a ligand.

87. (New) The method of claim 47, wherein the leaving group represented by Y is a halogen atom or a sulfonic ester group of formula  $-\text{OSO}_2\text{-R}_e$ , in which  $\text{R}_e$  is a hydrocarbon group.

88. (New) The method of claim 56, wherein the hydrocarbon group having from 1 to 20 carbon atoms is a linear or branched, saturated or unsaturated, acyclic aliphatic group; a monocyclic or polycyclic, saturated, unsaturated or aromatic carbocyclic or heterocyclic group; or a chain of the abovementioned groups.

89. (New) The method of claim 65, wherein mineral salt is a nitrate, a sulfate, an oxysulfate, a halide, an oxyhalide or a carbonate.

90. (New) The method of claim 65 wherein the organic derivative is a cyanide, an oxalate, an acetylacetonate, an alkoxide, a methoxide, an ethoxide, a carboxylate, or an acetate.

91. (New) The method of claim 65, wherein the complex is a chlorinated or cyanated complex of Pd metals, of alkali metals, of Pd and alkali metals, or of ammonium.

92. (New) The method of claim 91, wherein the alkali metal is sodium or potassium.

93. (New) The method of claim 72, wherein the bivalent metal is an alkali earth metal, an alkaline earth metal, or combinations thereof.

94. (New) The method of claim 78, wherein the amount ranges between 0.01 and 0.1.

95. (New) The method of claim 80, wherein the aliphatic hydrocarbon is a hexane, a cyclohexane, a methylcyclohexane, or petroleum ether cuts.

96. (New) The method of claim 80 wherein the aromatic hydrocarbon is benzene, toluene, xylenes, cumene, mesitylene, or petroleum cuts consisting of a mixture of alkylbenzenes.

97. (New) The method of claim 81, wherein the co-solvent is used in an amount representing 10 to 20% of the volume of the alcohol solvent.

98. (New) The method of claim 83, wherein the temperature is situated between 90°C and 110°C.